

Atty Dkt. No.: 10990631-2
USPN: 09/900,291

AMENDMENTS TO THE SPECIFICATION

Please replace the title of the application at page 1 with the following new title:

~~APPARATUS AND METHOD FOR CONDUCTING CHEMICAL OR BIOCHEMICAL~~ REACTIONS ON A SOLID SURFACE WITHIN AN ENCLOSED CHAMBER

Please replace the paragraph bridging pages 3-4, with the following amended paragraph:

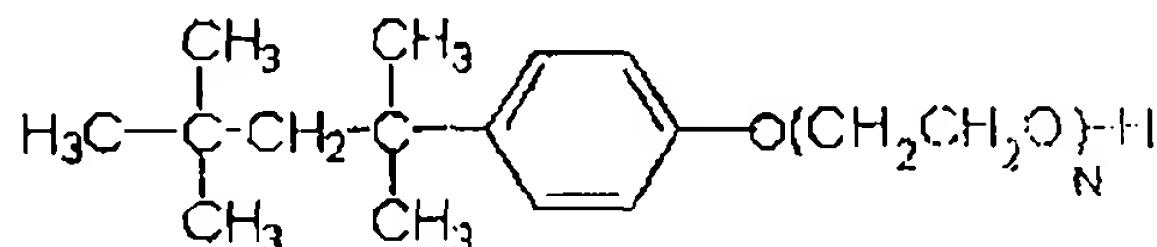
It is possible to pre-fabricate the chamber and array before use, and so improve the uniformity of the apparatus, as described, for example, in co-pending, commonly assigned U.S. Patent Application Serial No. 09/299,976, filed 4/27/99, now U.S. Patent No. 6,261,523, entitled "Adjustable Volume, Scaled Chemical-Solution-Confinement Vessel." That application describes a chamber formed by bonding a glass substrate into a plastic package. However, such a custom-designed package requires specialized processing equipment, and so cannot be used with arrays produced by a laboratory or by sources of generic arrays.

Please replace the paragraph bridging pages 14-15, with the following amended paragraph:

For use in hybridization, the reaction chamber, i.e., the "hybridization chamber," in this embodiment, is filled with a sample fluid comprising a target molecule which may hybridize to a surface-bound molecular probe, and with a surfactant of a type and present at a concentration effective to substantially reduce nonspecific binding and promote mixing of components within the sample fluid. The surfactant is selected from the group consisting of anionic surfactants, cationic surfactants, amphoteric surfactants, nonionic surfactants, and combinations thereof, with anionic surfactants and polymeric nonionic surfactants particularly preferred. Suitable anionic surfactants include, but are not limited to, the sodium, potassium, ammonium and lithium salts of lauryl sulfate, with lithium lauryl sulfate most preferred. A preferred polymeric nonionic surfactant is polyethylene oxide, with particularly preferred polyethylene oxides comprising an alkylphenol ethylene oxide condensate. Such surfactants may be obtained commercially under the trade name "Triton" from the Sigma Chemical Company (St. Louis, MO), and including, for example, Triton X-100 (octylphenol ethylene oxide

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condensate) and Triton X-102 (also an octylphenol ethylene oxide condensate). More specifically, Triton X surfactants have been described as having the formula:



(1)

in which N for Triton X-100 has an average of about 9.5 units per molecule while for Triton X-102 N is an average of about 12.5 units per molecule. Further information on both Triton X-100 and Triton X-102 can be obtained from Sigma-Aldrich, Co. found at the following Internet addresses:

~~"www.sigma-aldrich.com/sigma/proddata/t6878.htm"~~ and

~~"www.sigma-aldrich.com/sigma/proddata/t6878x.htm"~~

~~Copies of the foregoing material printed from these sites on June 25, 1999, are being filed with an Information Disclosure Statement filed on the same date with this application. The foregoing, and all other references~~ References cited herein are incorporated in this application by reference.

Please replace the paragraph bridging pages 15-16, with the following amended paragraph:

The invention is particularly useful in conjunction with substrate surfaces functionalized with silane mixtures, as described in co-pending, commonly assigned U.S. Patent Application Serial No. 09/145,015, filed September 1, 1998, now U.S. Patent No. 6,258,015, and entitled "Functionalization of Substrate Surfaces with Silane Mixtures." That method provides a functionalized surface on a substrate with low surface energy. The method for preparing such a surface comprises contacting a substrate having reactive hydrophilic moieties on its surface with a derivatizing composition comprising silane-containing groups R1-Si(R1.RxRy) and R2-(L)n-Si(R1.RxRy) under reaction conditions effective to couple the silanes to the substrate. This provides -Si-R1 and -Si-(L)n-R2 groups on the substrate. The R1, which may be the same or different, are leaving groups, the Rx and Ry which may also be the same or different, are either leaving groups, like RL, or are lower alkyl, R1 is a chemically inert moiety that upon binding to the substrate surface lowers the surface energy thereof, n is 0 or 1, L is a linking group, and R2 comprises either a functional group enabling covalent binding of a molecular moiety or a group that may be modified to provide such a functional group. The ratio of the silanes in the derivatizing composition determines the surface energy of the functionalized substrate and the density of molecular

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moieties that can ultimately be bound to the substrate surface. When used in conjunction with the present invention, the surface-bound molecular probes are bound to the R2 moieties provided by the second silane-containing group.